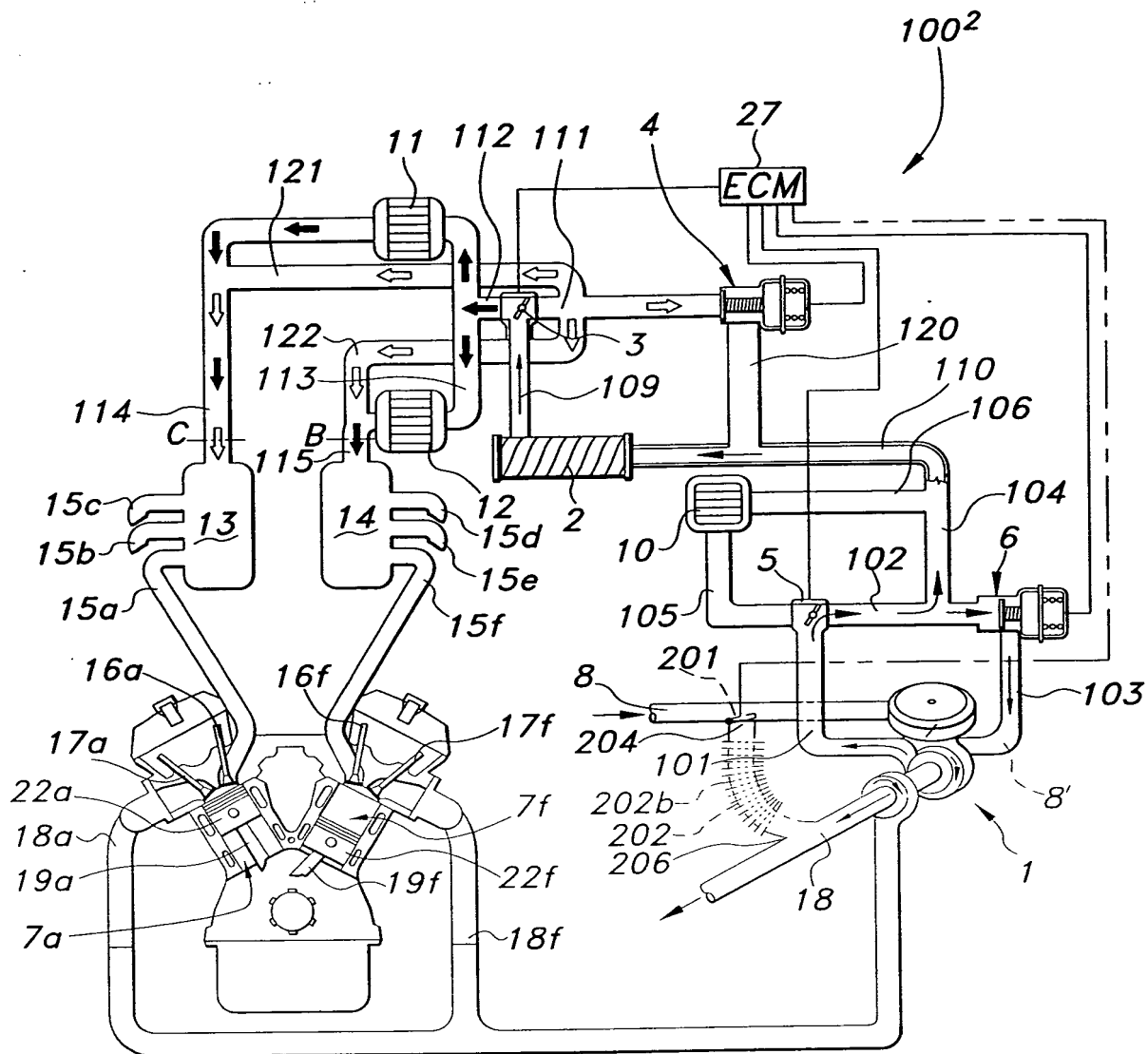
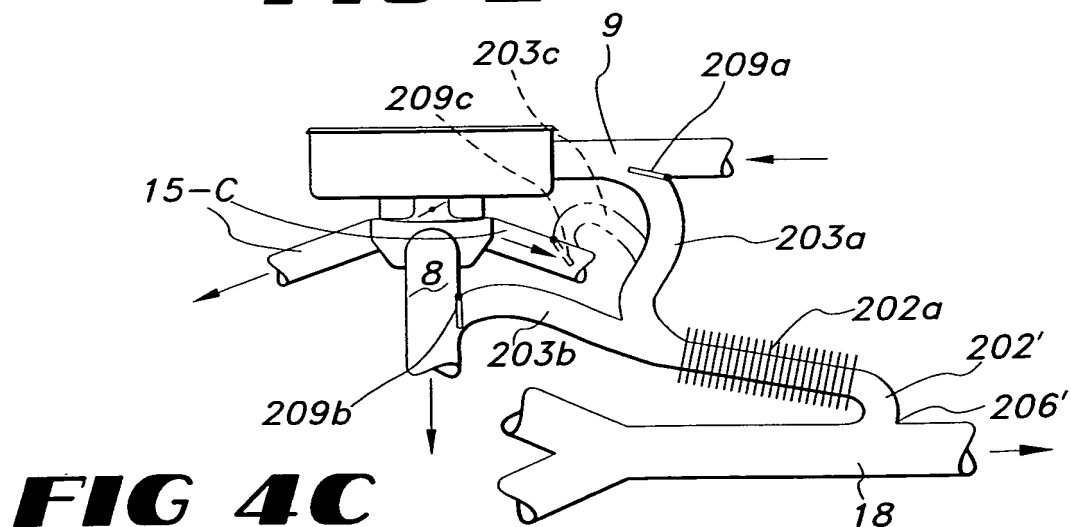


**FIG 1**



**FIG 2**



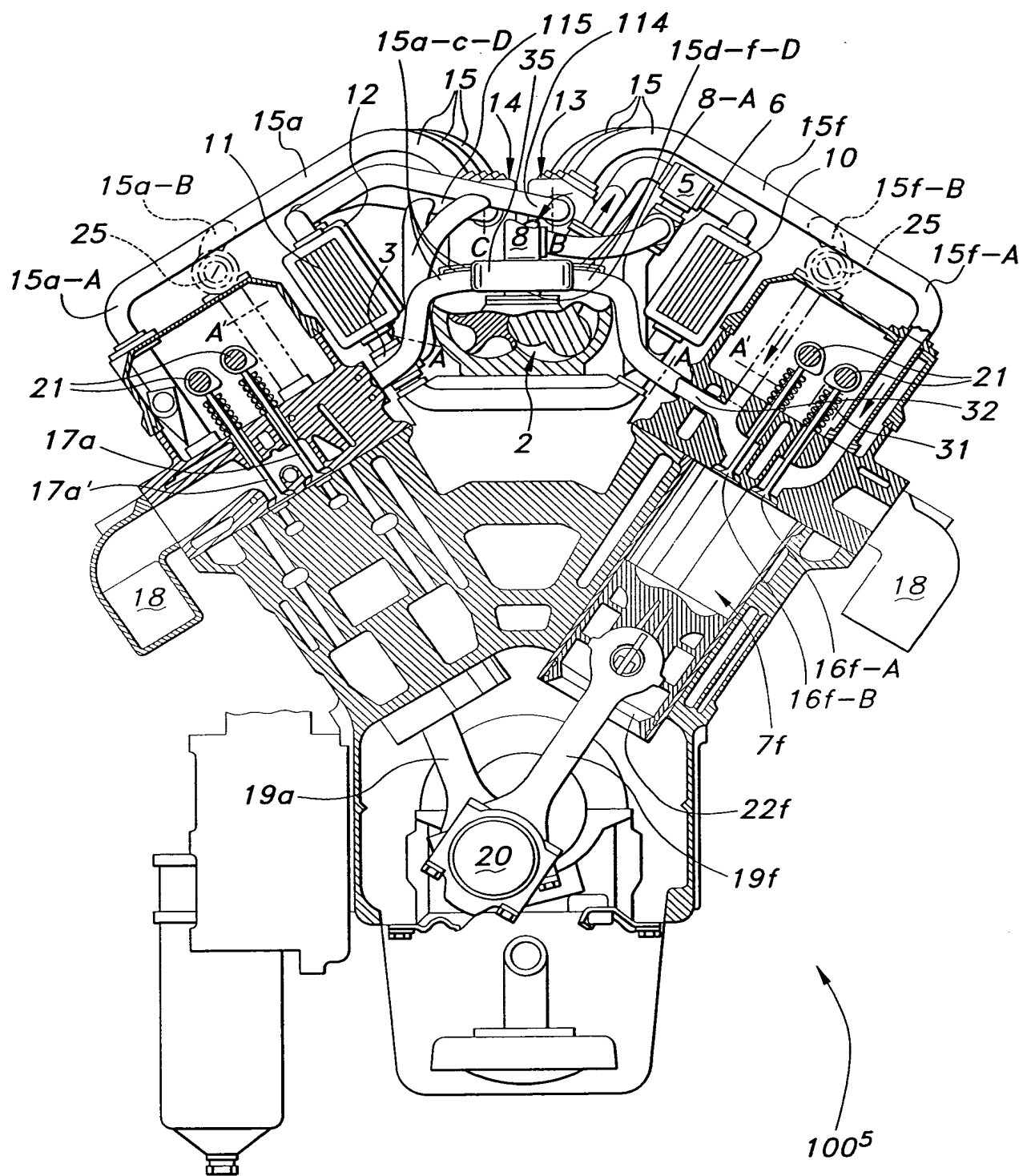
**FIG 4C**



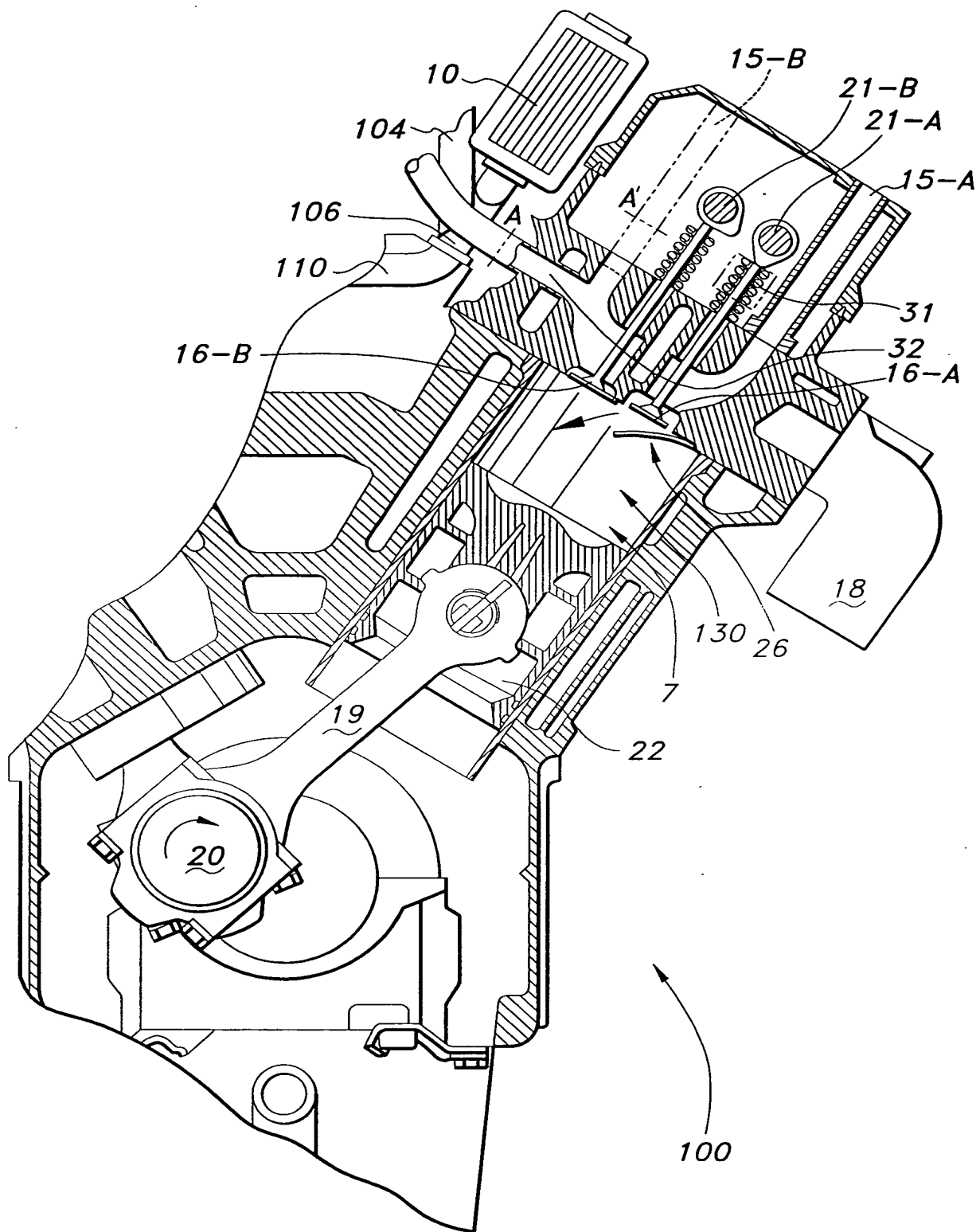
**FIG 3**



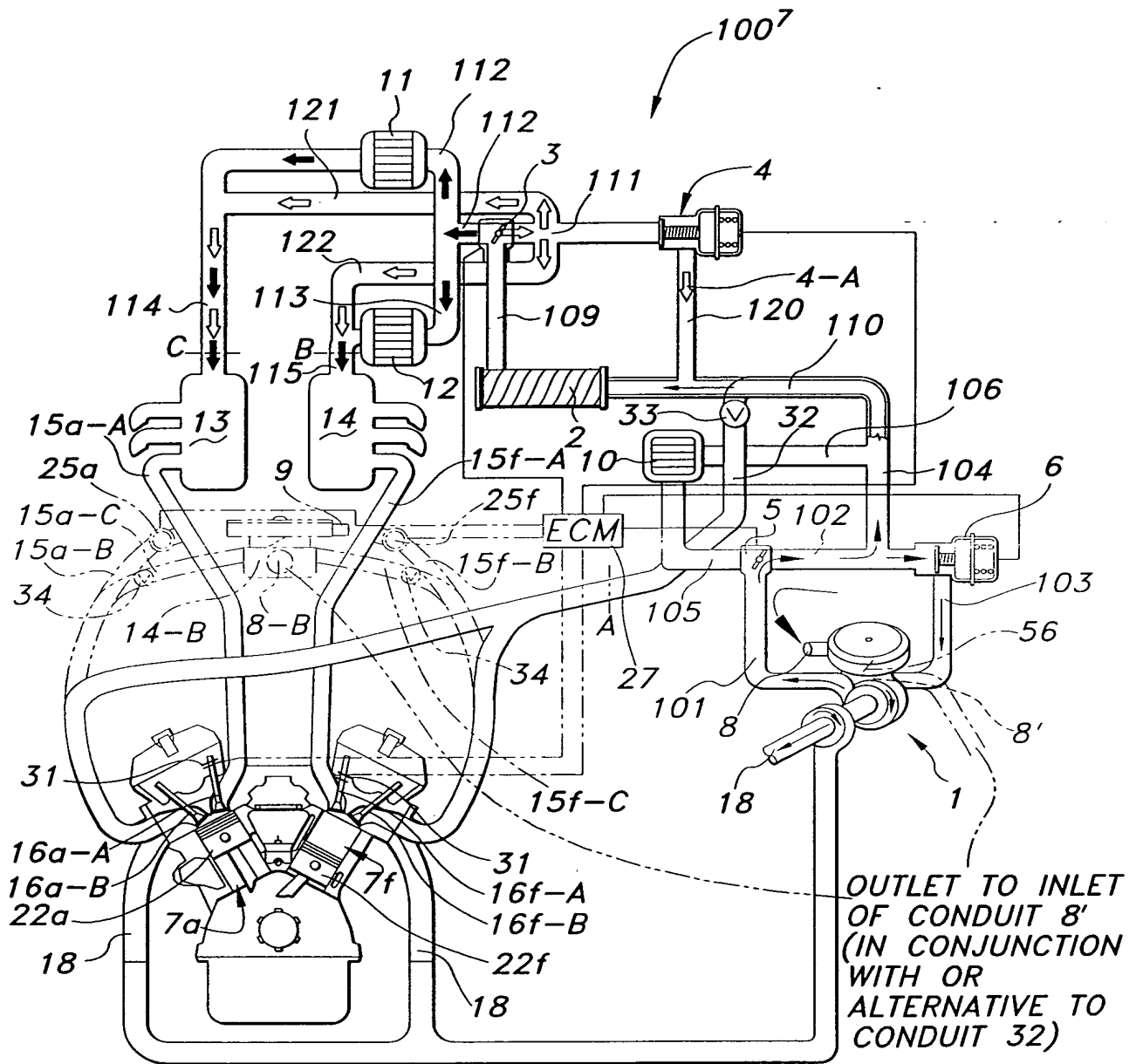




**FIG 5**

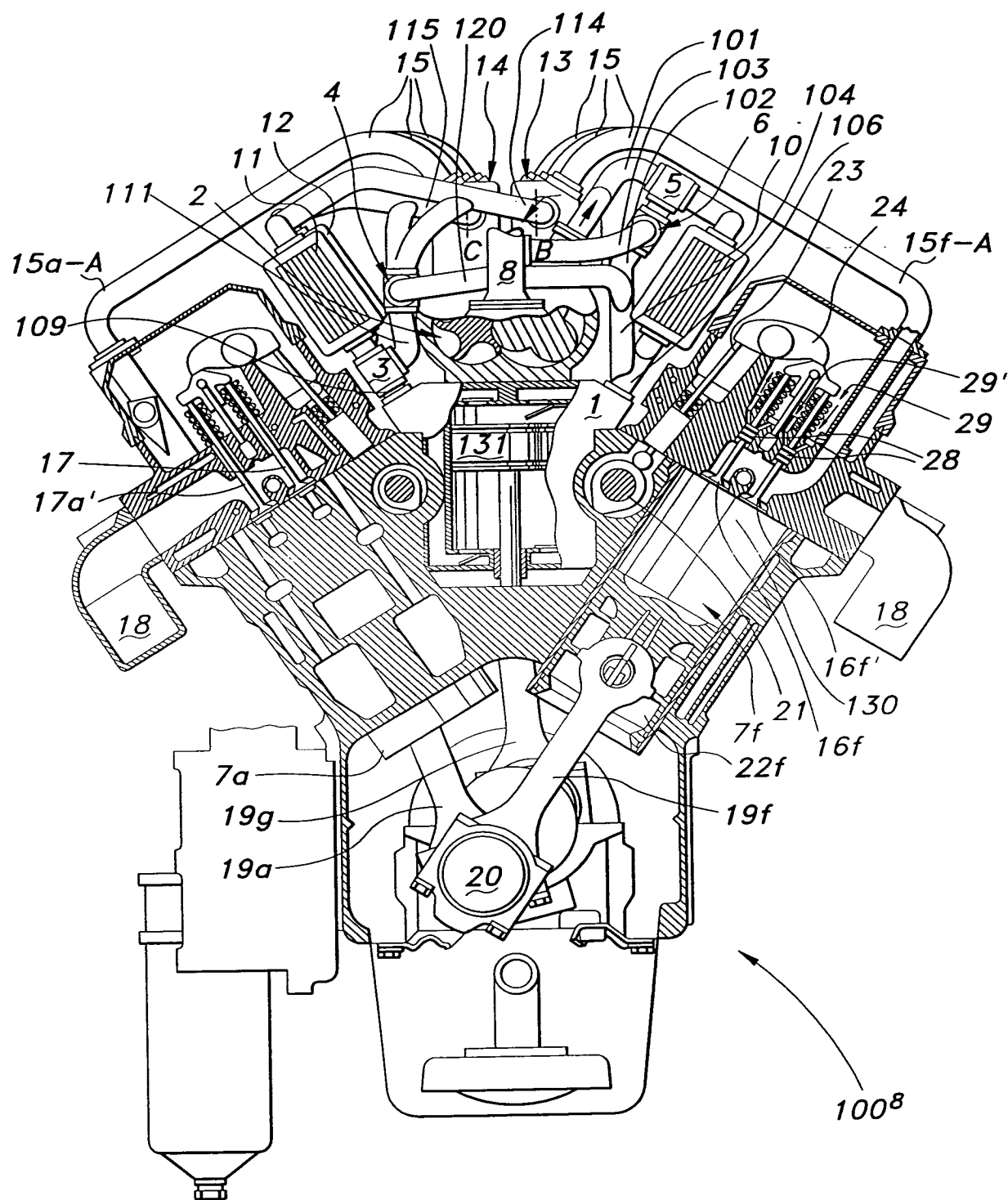


**FIG 6**

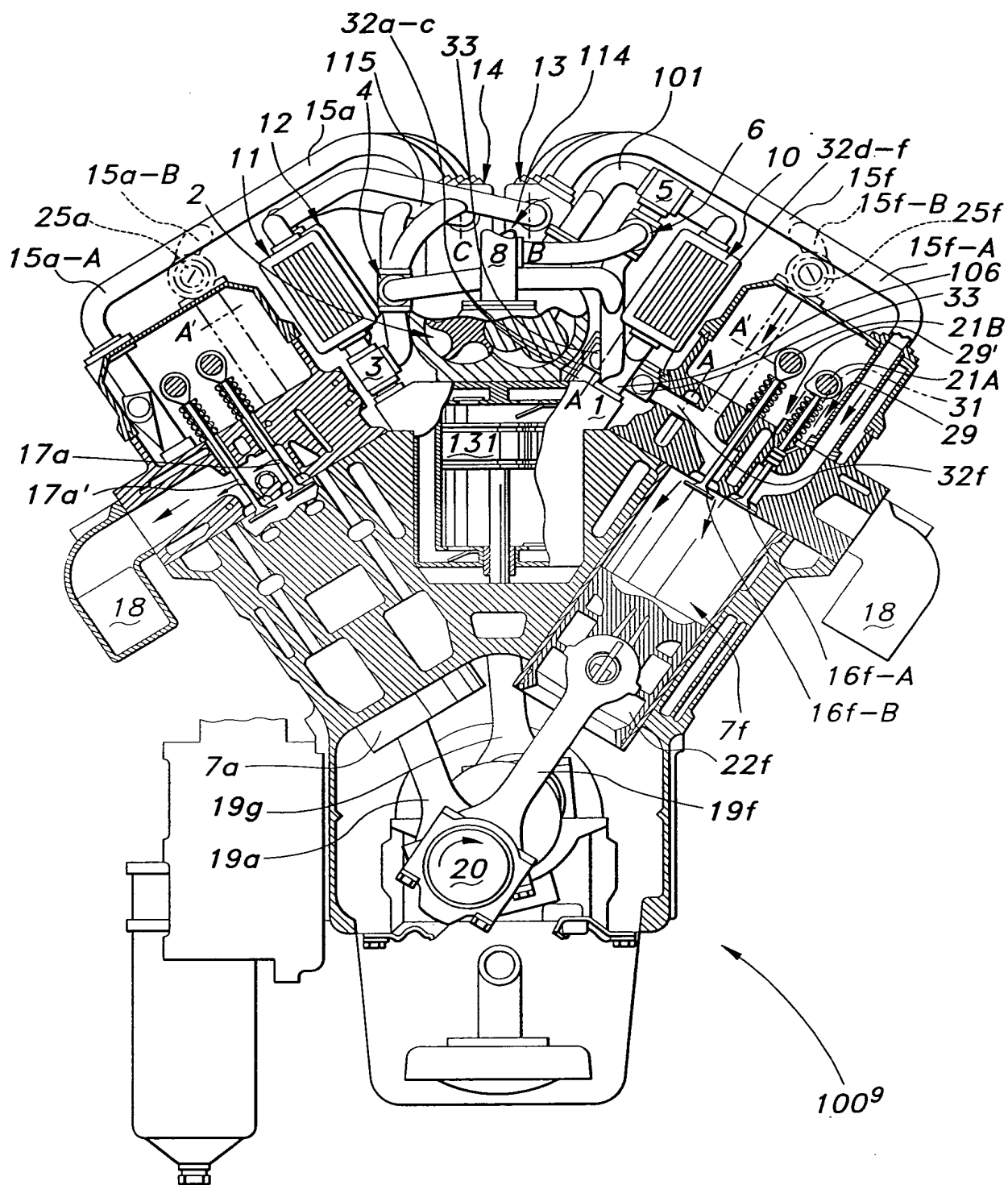


**FIG 7**



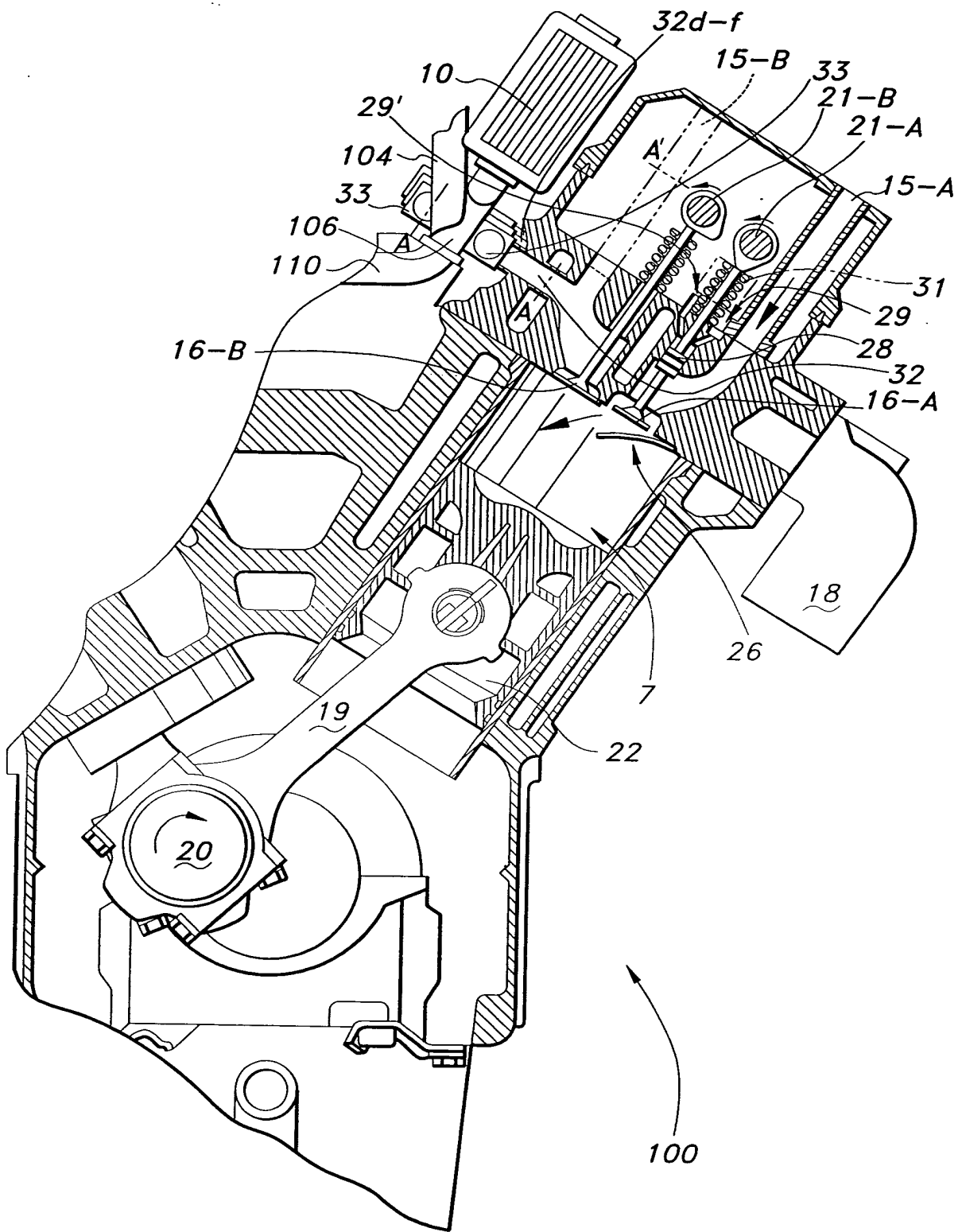


**FIG 8**

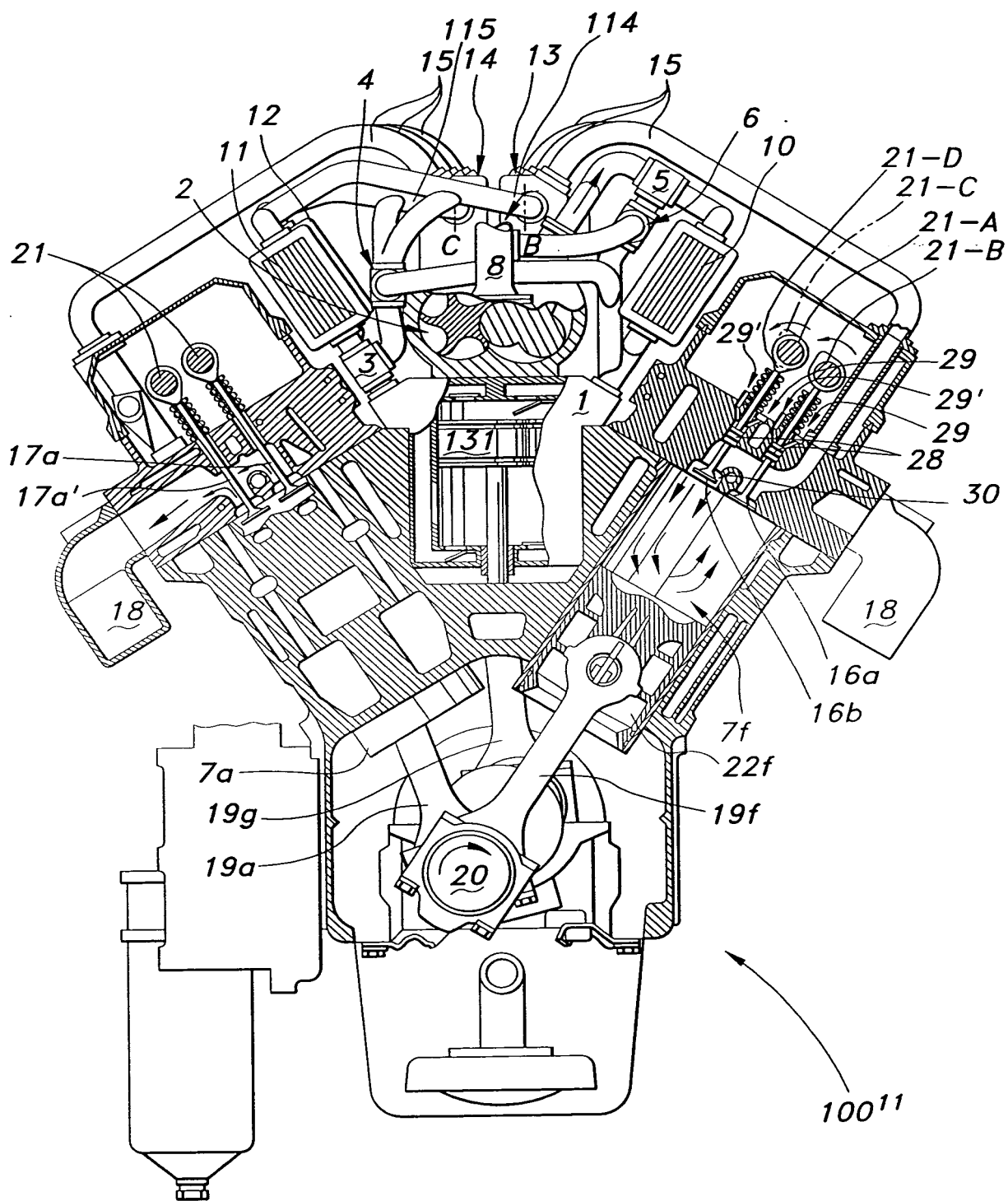


**FIG 9**

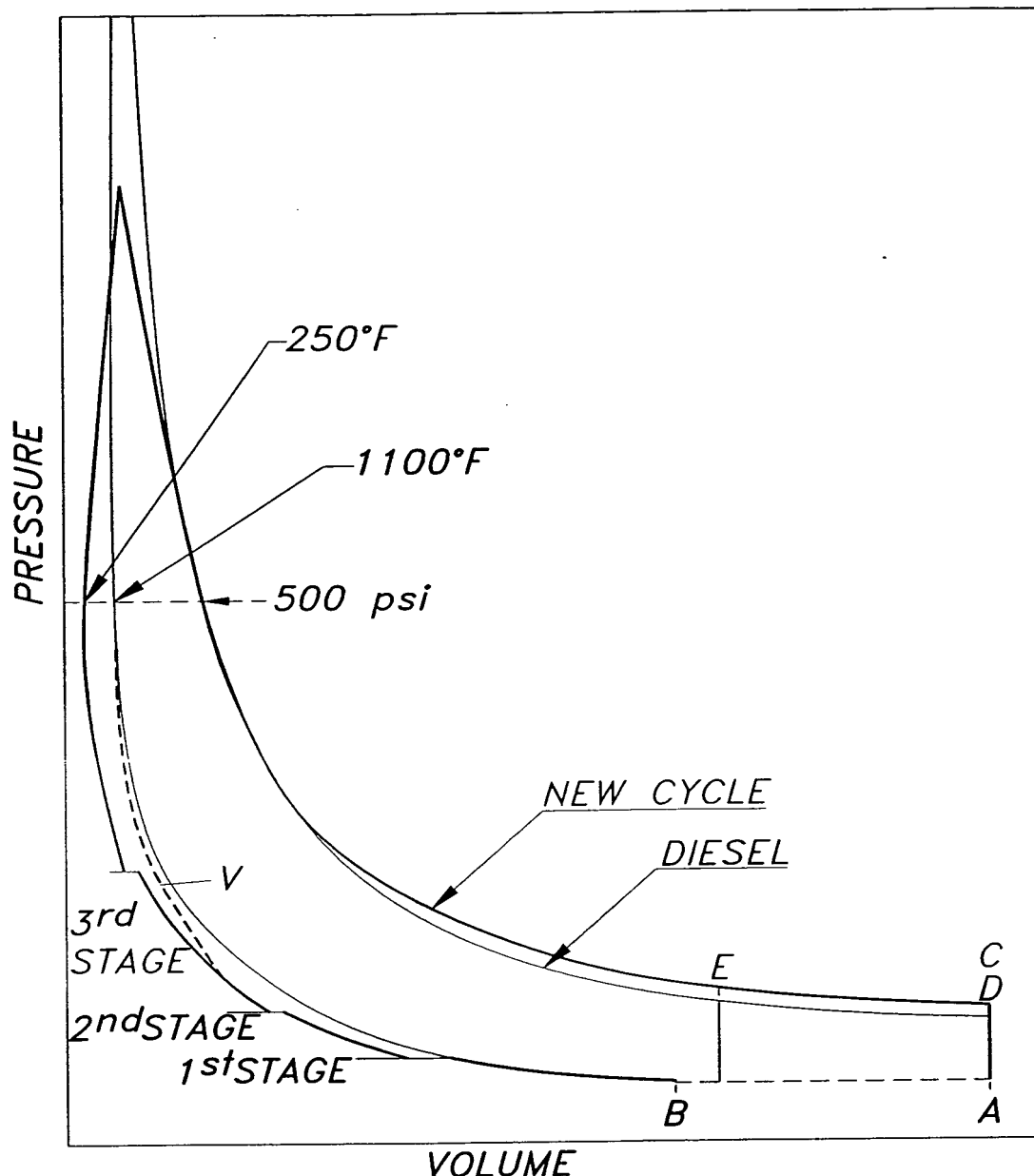




**FIG 10**



**FIG 11**



- A - COMPRESSION BEGINS IN 2-STROKE AND 4-STROKE DIESEL CYCLE ENGINE
- B - COMPRESSION BEGINS IN 2-STROKE AND 4-STROKE NEW CYCLE ENGINE
- C - EXPANSION ENDS IN 4-STROKE DIESEL CYCLE ENGINE
- D - EXPANSION ENDS IN 2-STROKE AND 4-STROKE NEW CYCLE ENGINE
- E - EXPANSION ENDS (AT EXHAUST BLOW-DOWN) IN 2-STROKE DIESEL CYCLE ENGINE
- V - SEE NOTE 1 IN DESCRIPTION

**FIG 12**

# COMPARISON OF OPERATING PARAMETERS OF A HEAVY DUTY TWO-STROKE DIESEL ENGINE (A)

WITH THE ENGINE OF THIS INVENTION (B)

ENGINE	COMPRESSION RATIO OR NOMINAL COMPRESSION RATIO	EFFECTIVE COMP RATIO	COMPRESSION PRESSURE (PSI)	TEMP @ END COMP (DEG F.)	TEMP @ END COMB (DEG F.)	CHARGE DENSITY (LB./CU. FT.)	EXPANSION RATIO	E.R. C. R.	CHARGE WEIGHT PER REVOLUTION (GRAMS)
A	19:1	19:1	907	1300	3400	1.45	*10:1	0.5	2.06
B(ic)	13:1	2:1	533	250	3000	2.03	**19:1	1.5	2.86
B(bp)	13:1	13:1	533	992	^3100	1.01	**19:1	1.5	1.43
B2(ic)	10:1	2:1	369	250	^2800	1.40	**19:1	1.9	1.98
B2(bp)	10:1	10:1	369	871	^2900	0.75	**19:1	1.9	1.06

\* Exhaust valve opens midstroke

\*\* Exhaust valve opens near BDC

(ic) Air charge intercooled except for last stage of compression

(bp) Intercoolers bypassed

^ Estimated

E.R. = EXPANSION RATIO  
C. R. = COMPRESSION RATIO

**FIG 13**

# COMPARISON OF OPERATING PARAMETERS OF A HEAVY DUTY FOUR-STROKE DIESEL ENGINE (A)

WITH THE ENGINE OF THIS INVENTION (B)

ENGINE	COMPRESSION RATIO OR NOMINAL COMPRESSION RATIO	EFFECTIVE COMP RATIO	COMPRESSION PRESSURE (PSI)	TEMP @ END COMP (DEG F.)	TEMP @ END COMB (DEG F.)	CHARGE DENSITY (LB./CU. FT.)	EXPANSION RATIO	E.R. C.R.	CHARGE WEIGHT PER REVOLUTION (GRAMS)
A	19:1	19:1	907	1300	3400	1.45	19:1	1.0	*1.03
B(ic)	13:1	2:1	533	250	3000	2.03	19:1	1.5	**2.86
B(bp)	13:1	13:1	533	992	^3100	1.01	19:1	1.5	**1.43
B2(ic)	10:1	2:1	369	250	^2800	1.40	19:1	1.9	**1.98
B2(bp)	10:1	10:1	369	871	^2900	0.75	19:1	1.9	**1.06

\* Per revolution, not per firing stroke

\*\* Per revolution and per firing stroke

(ic) Air charge intercooled except for last stage of compression

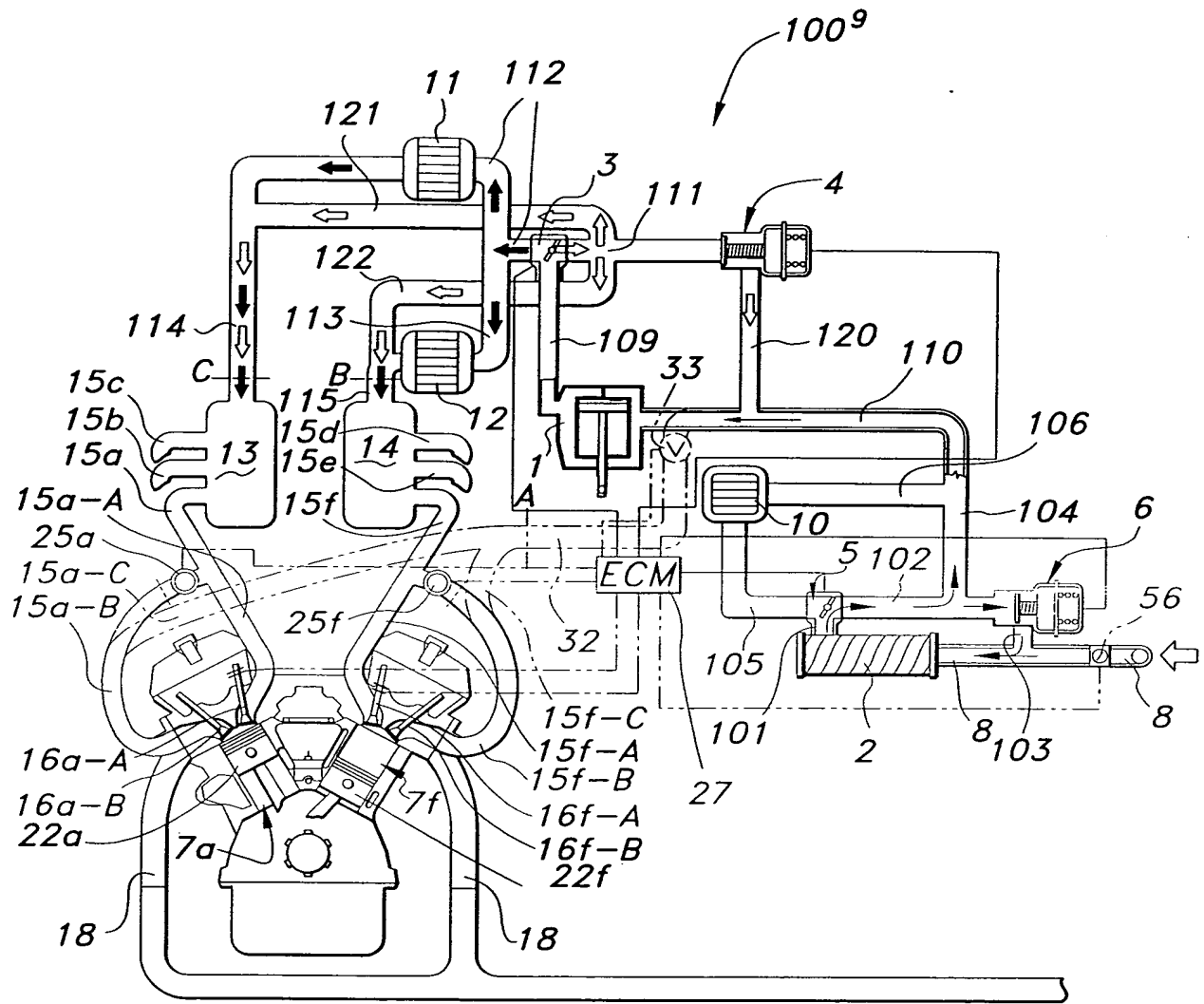
(bp) Intrecoolers bypassed

^ Estimated

E.R. = EXPANSION RATIO  
C.R. = COMPRESSION RATIO

**FIG 14**

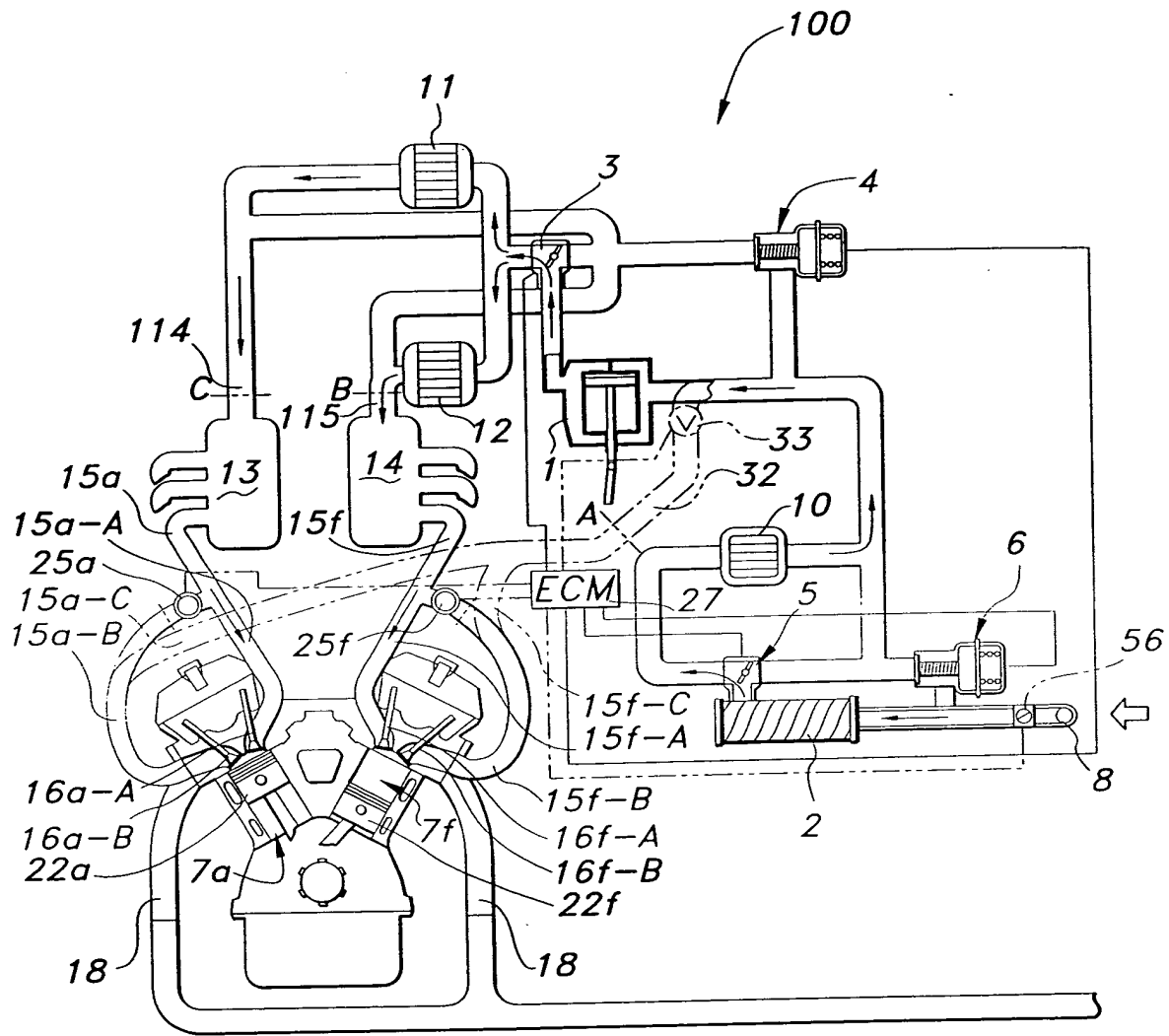




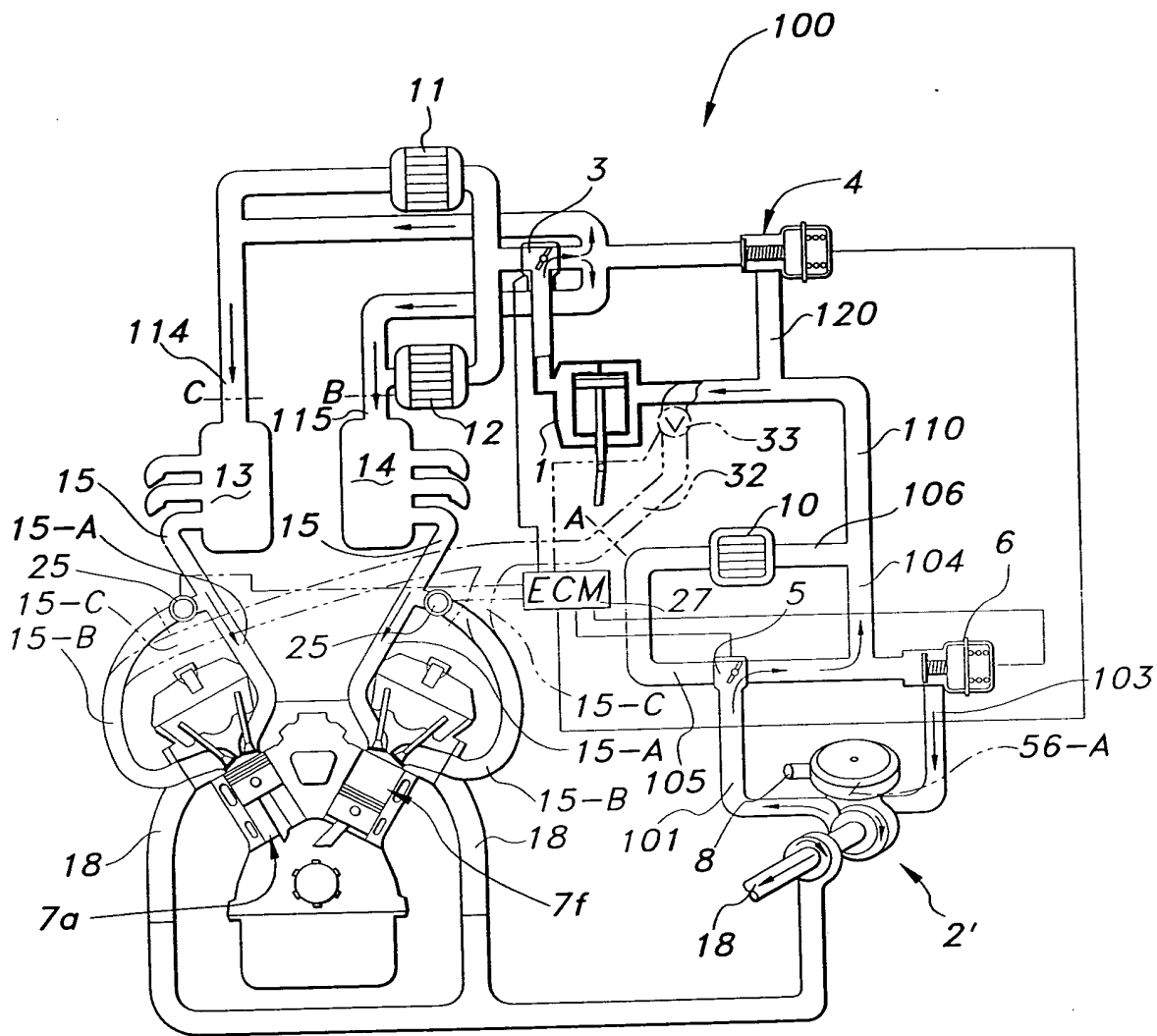
**FIG 15**



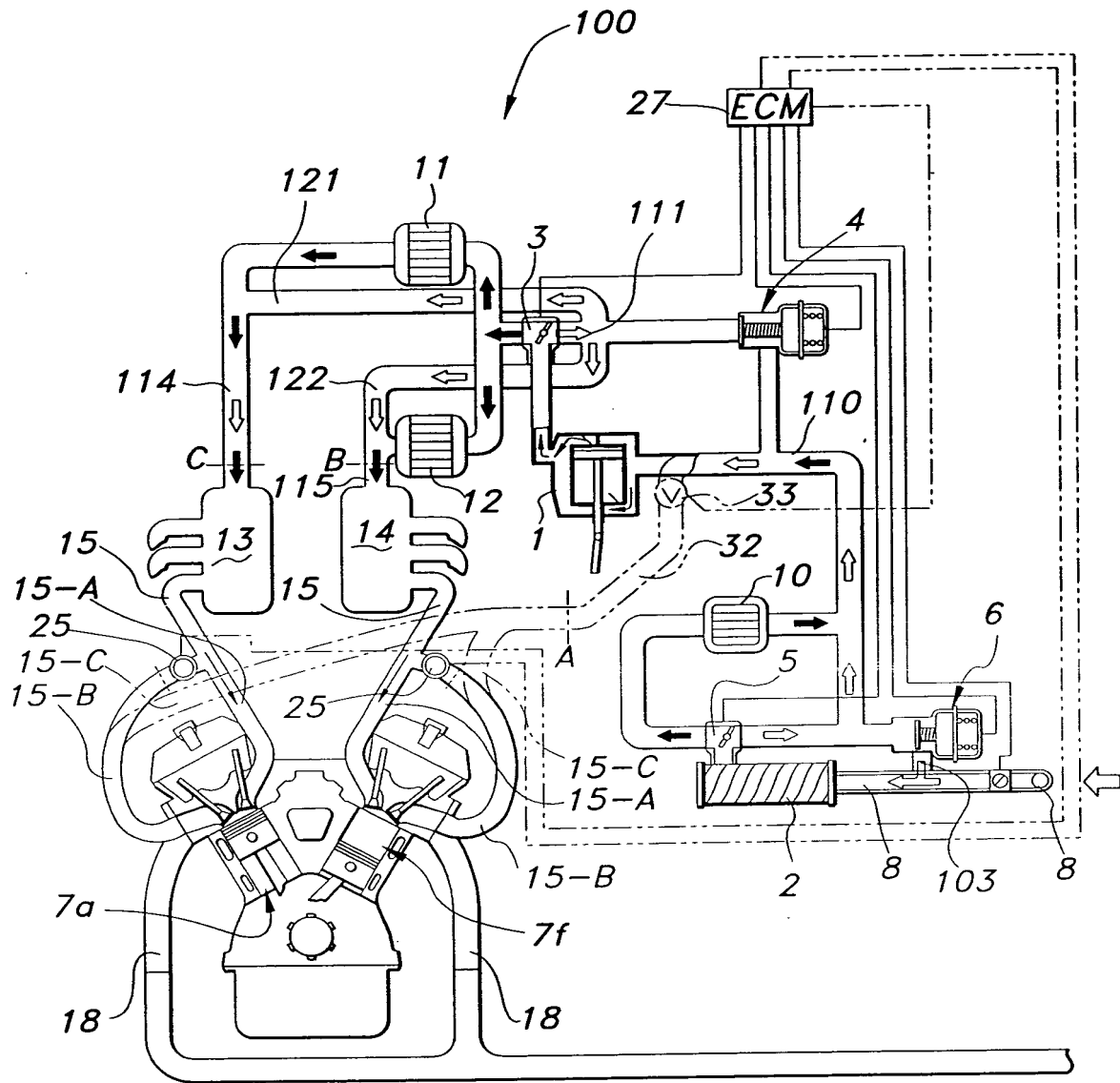
**FIG 16**



**FIG 17**



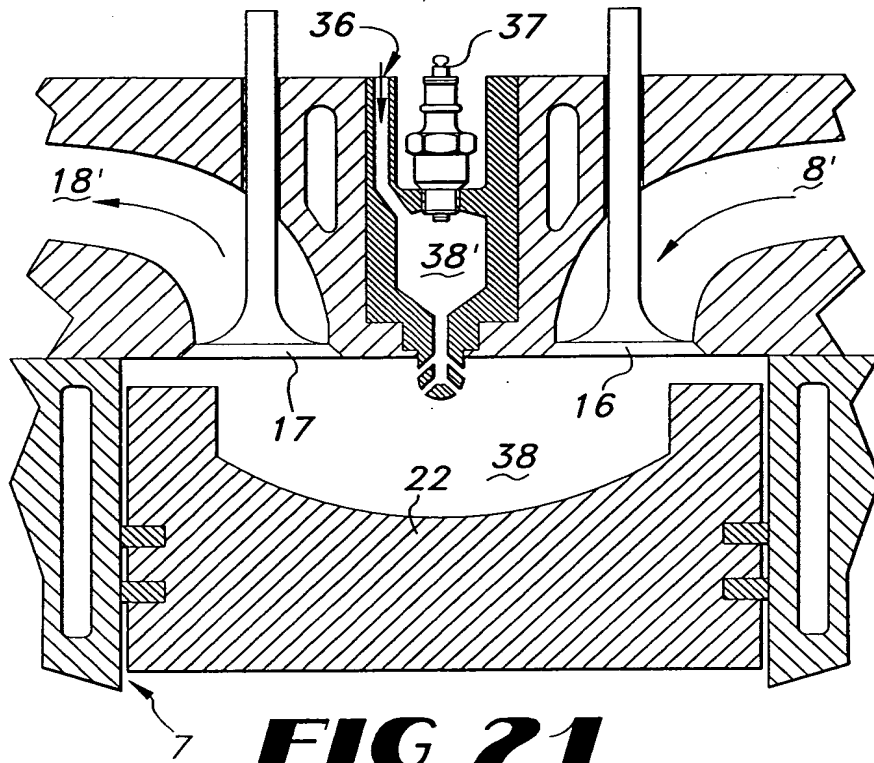
**FIG 18**



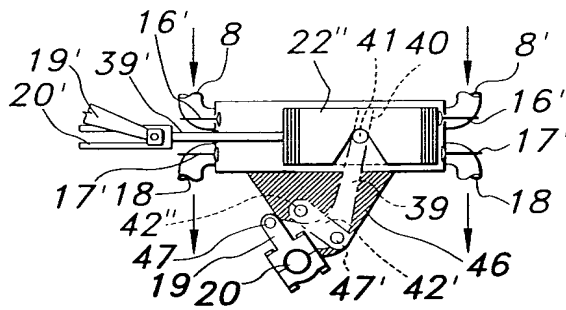
**FIG 19**



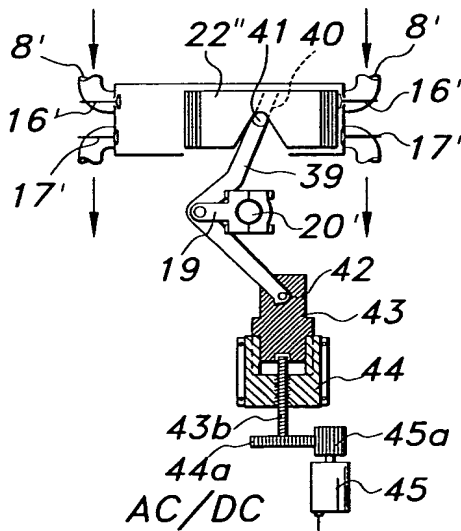
**FIG 20**



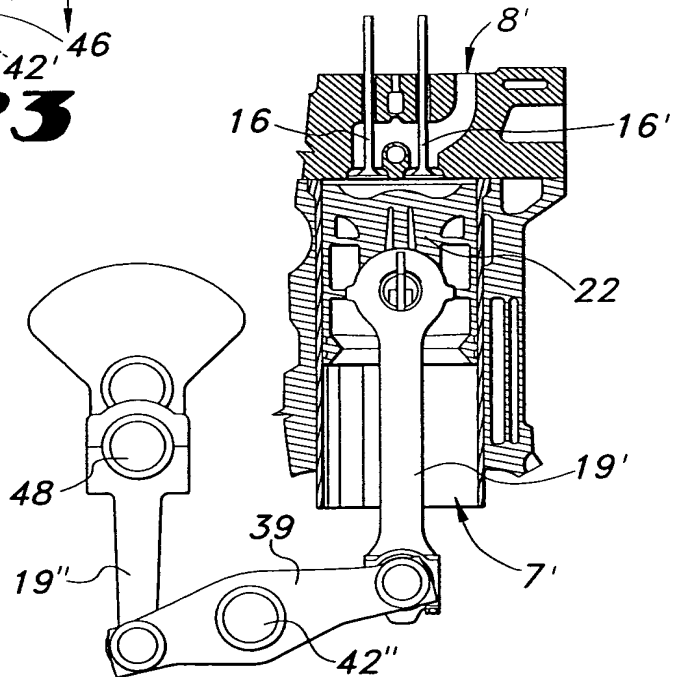
**FIG 21**



**FIG 23**



**FIG 22**

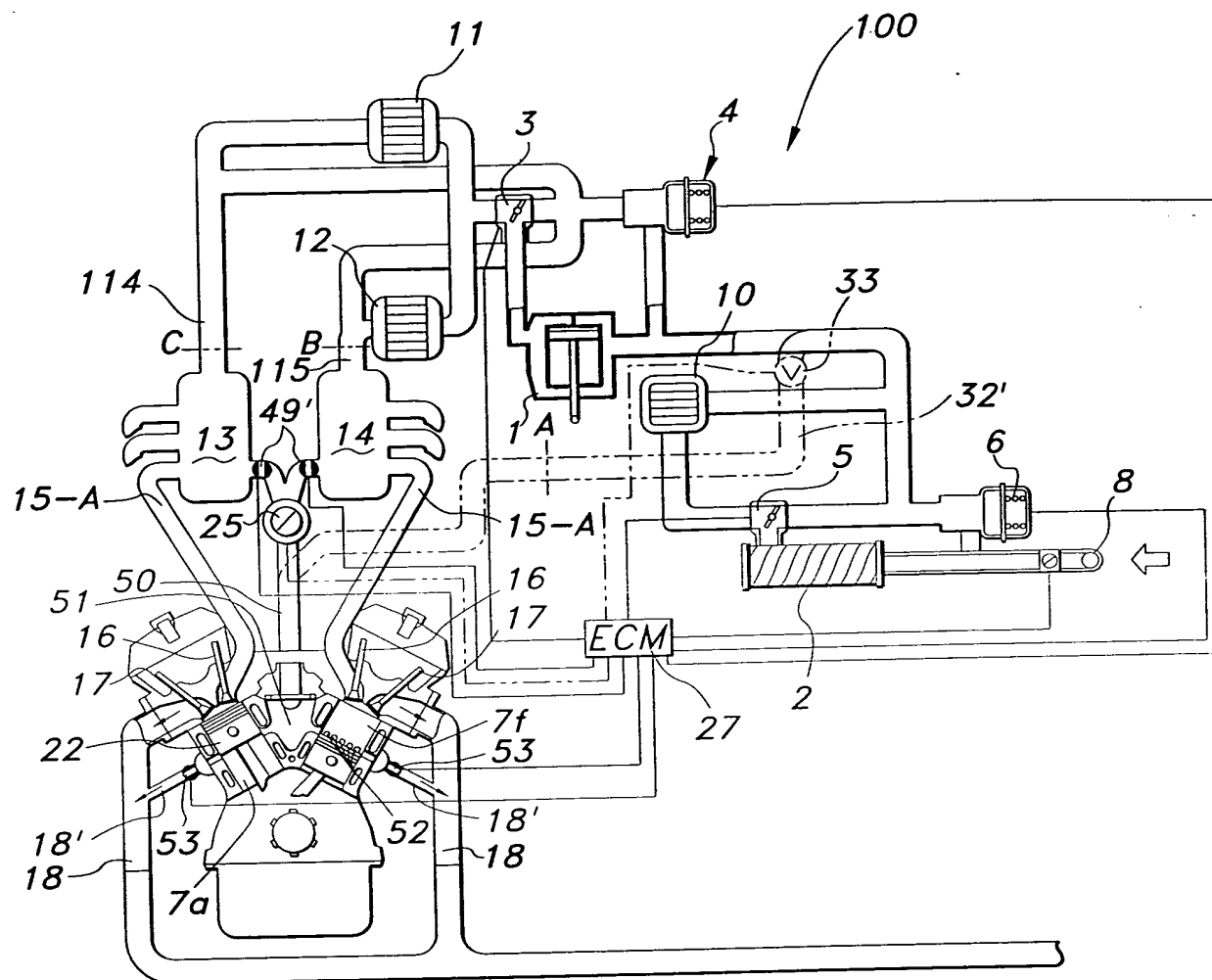


**FIG 24**

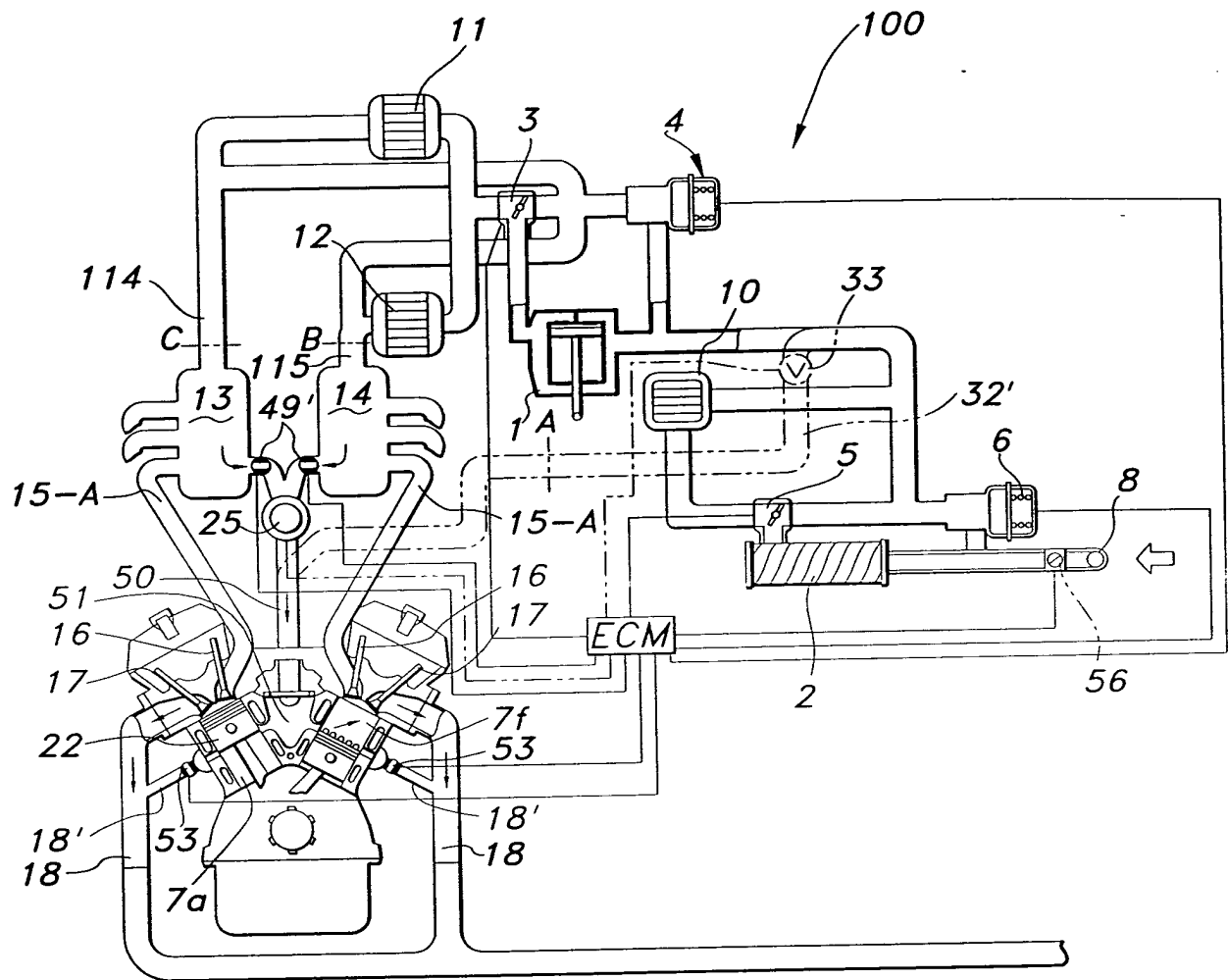




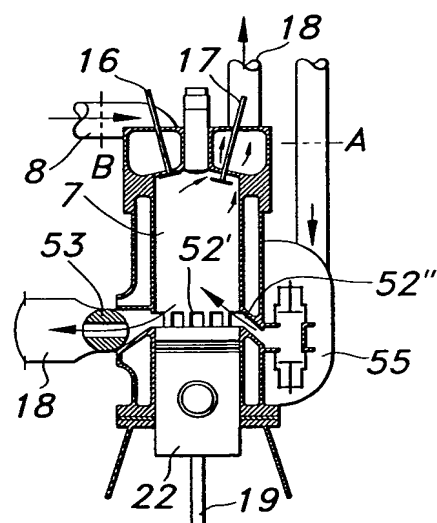
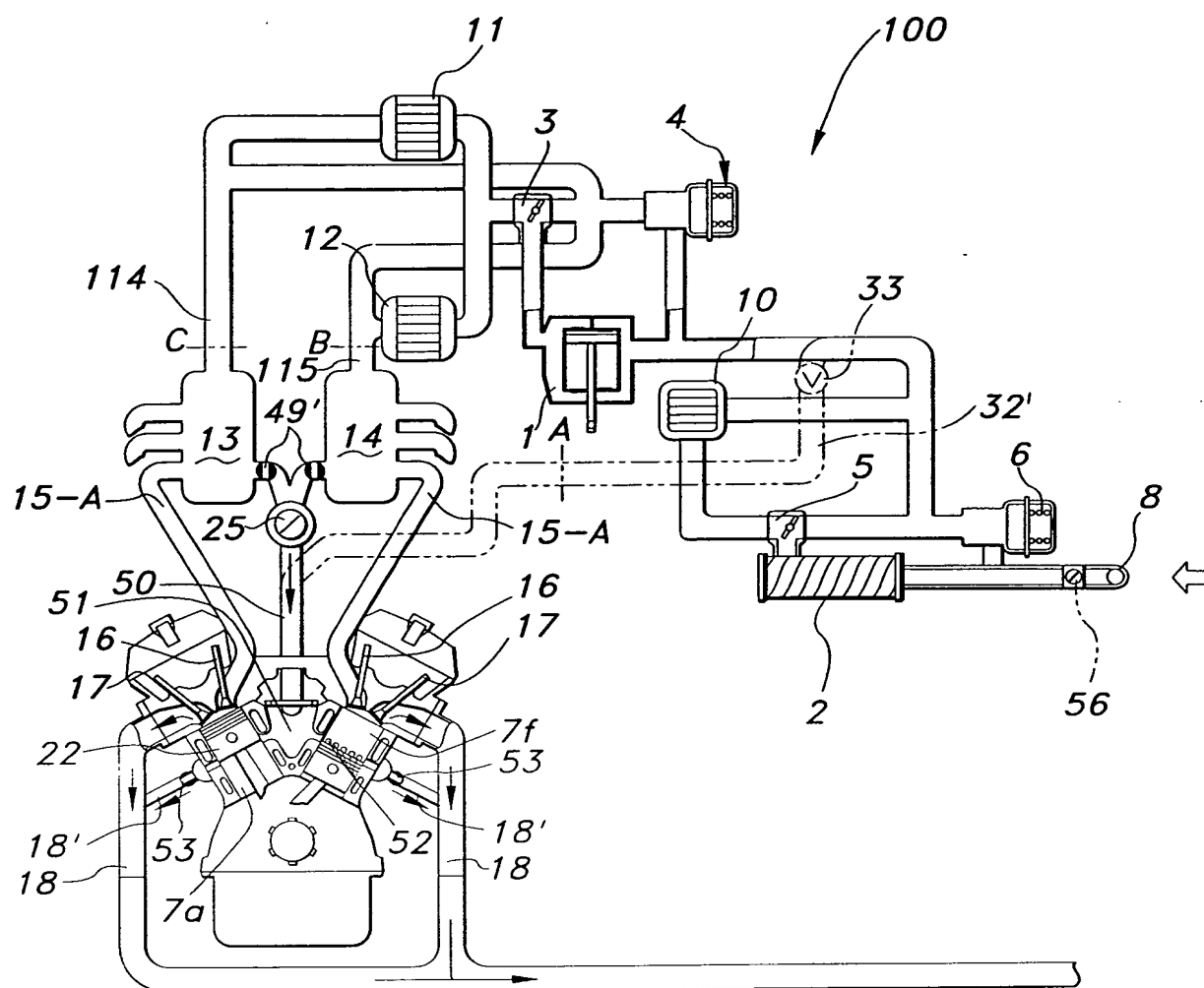


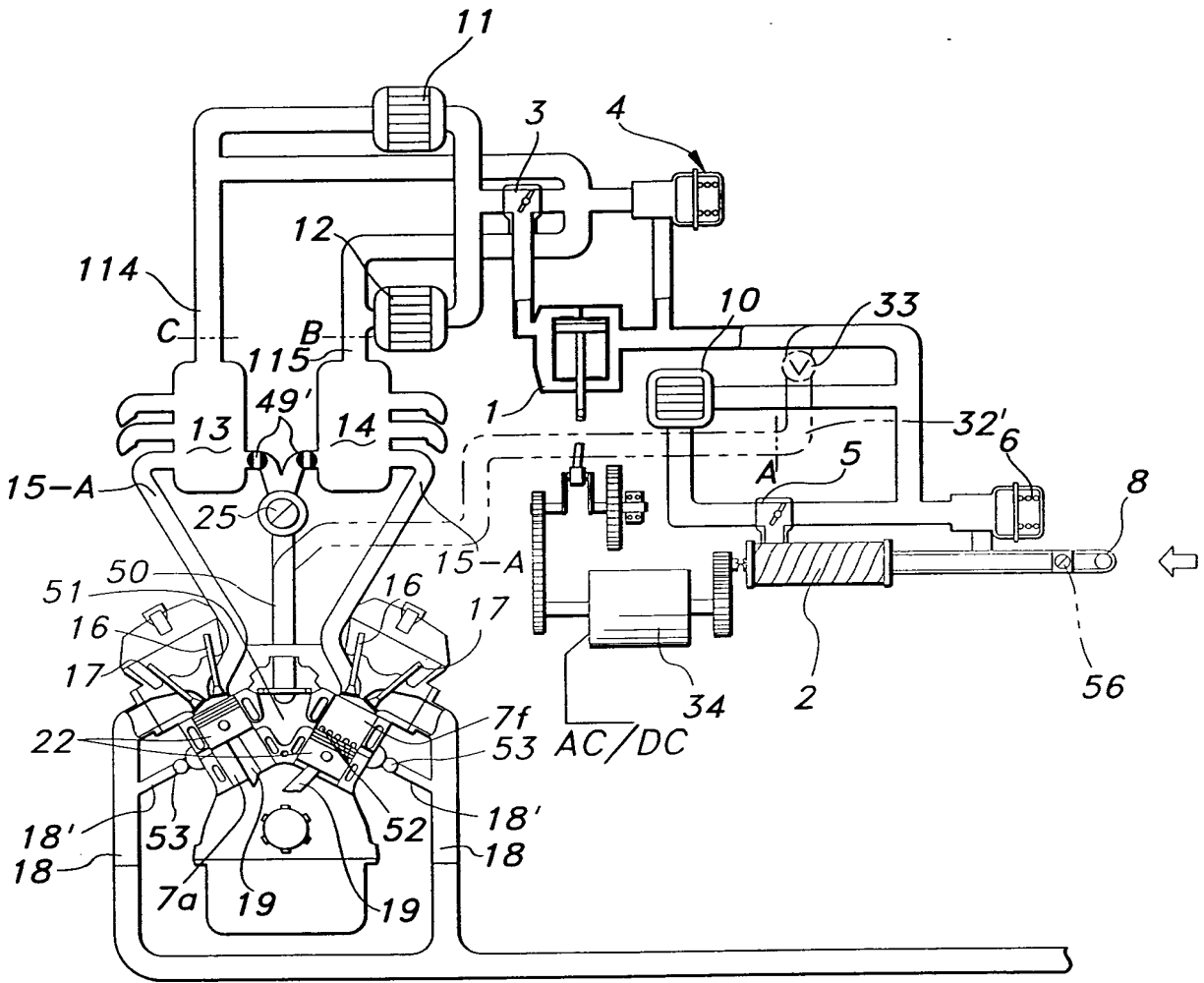


**FIG 27**



**FIG 28**





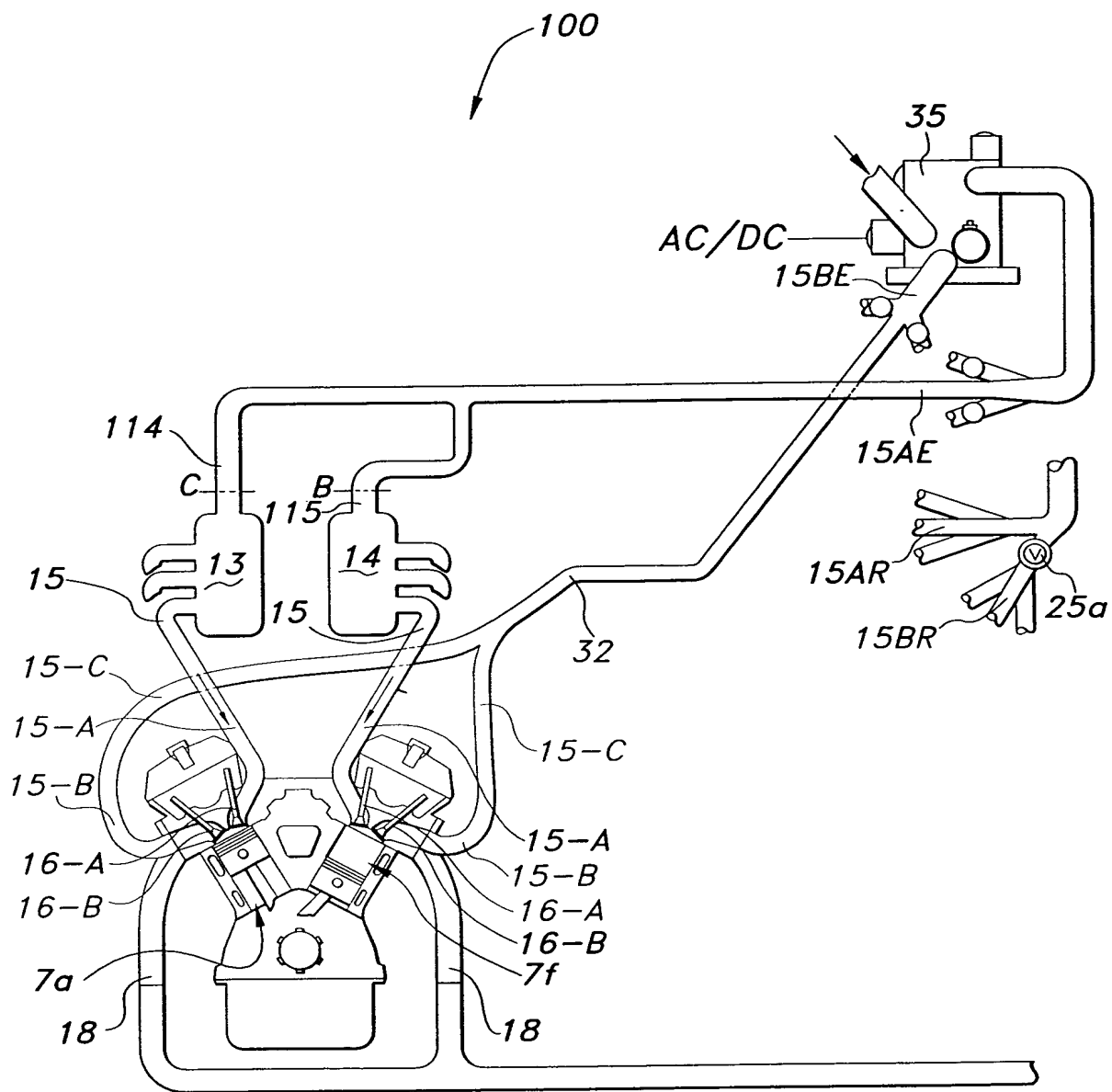
**FIG 31**



**FIG 32**



**FIG 33**

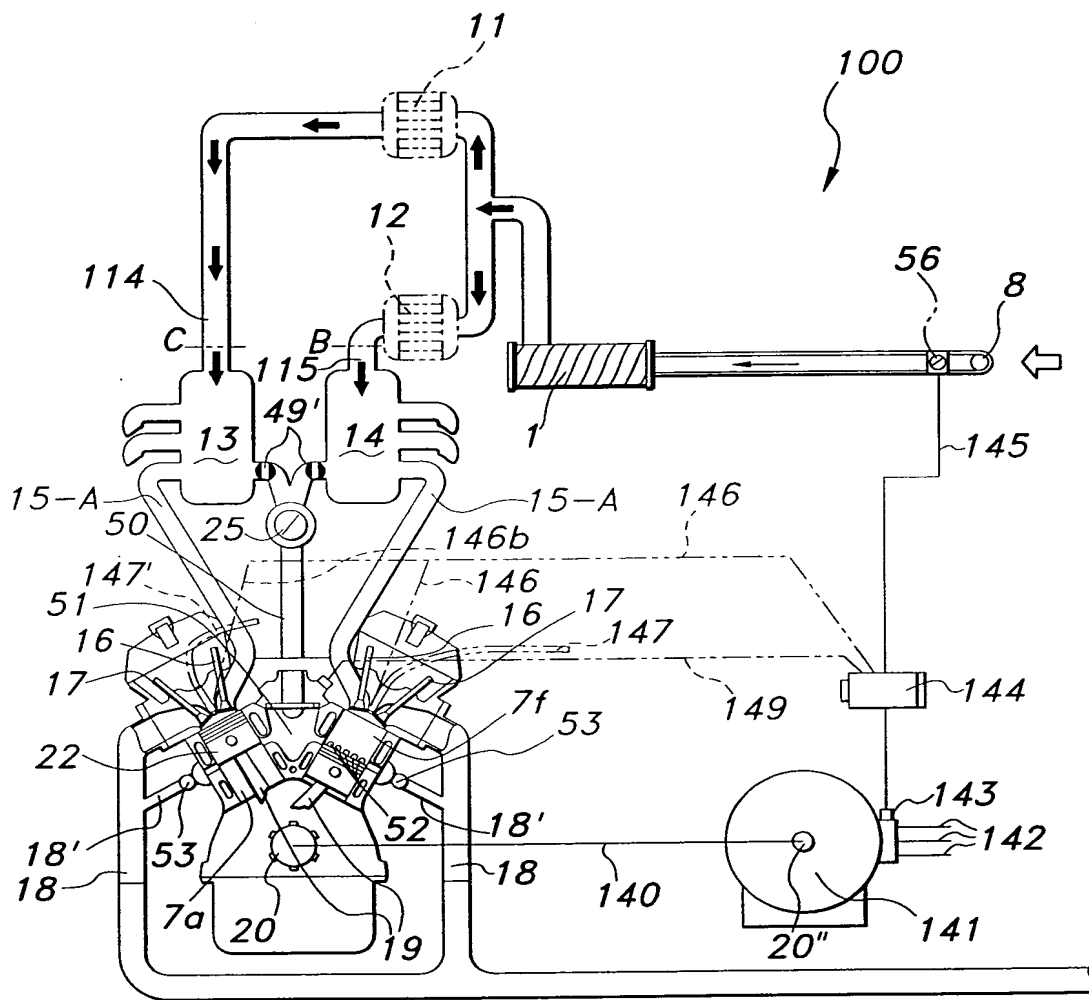


**FIG 34**





**FIG 35**



**FIG 36**